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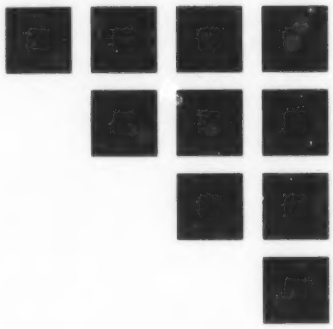


Earnings of Post-Secondary Graduates in Canada: Holding Their Own

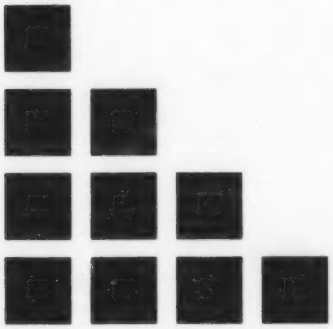
Trends in Employment Rates and Earnings Levels

R-99-12E.a

by
Ross Finnie

March 1999

Research Paper



Human Resources Development Canada
Développement des ressources humaines Canada

Canada

Applied Research Branch
Strategic Policy
Human Resources Development Canada

Direction générale de la recherche appliquée
Politique stratégique
Développement des ressources humaines Canada

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Abstract

This paper reports the results of a cross-cohort, longitudinal analysis of the early labour market outcomes of three recent cohorts of Canadian post-secondary graduates based on the National Graduates Surveys databases. These comprise large, representative samples of Canadian post-secondary students who successfully completed their college and university programmes in 1982, 1986, and 1990, along with information gathered during interviews conducted two and five years following graduation. The analysis is broken down by sex and level of education—College, Bachelor's, Master's, and Ph.D. degrees. Among the key findings are:

- For each class and for each group of graduates (by level of education and sex), there were significant improvements in employment rates and earnings levels from two to five years following graduation.

- Contrary to common belief, there was no general deterioration of labour market outcomes from the earliest cohort to the most recent one.

- The gender earnings gap narrowed over the three cohorts, but the female gains were much greater at the time of the first interview than the second, suggesting that there might be less catching up over the full career than the record immediately following graduation might indicate.

This report is part of a set of research studies comprised of:

Earnings of Post-Secondary Graduates in Canada:

- *Holding Their Own – Trends in Employment Rates and Earnings Levels*
- *Changes in the Structure of Earnings in the 1980s and 1990s*

Résumé

Ce document présente les résultats d'une analyse longitudinale de trois cohortes de diplômés postsecondaires au Canada à partir des *Enquêtes nationales auprès des diplômés*. Ces données comprennent un grand nombre d'échantillons représentatifs d'étudiants qui ont terminé avec succès un programme d'études universitaire ou collégial canadien en 1982, 1986 et 1990, ainsi que des renseignements recueillis dans le cadre d'entrevues effectuées deux et cinq ans après l'obtention du diplôme. L'analyse est répartie selon le sexe et le niveau d'études—diplôme collégial, baccalauréat, maîtrise ou doctorat. Voici certains des principaux résultats :

- Pour chaque classe et groupe de diplômés (par niveau d'études et selon le sexe), les taux d'emploi et les niveaux de rémunération se sont améliorés de façon importante de deux à cinq ans après l'obtention du diplôme.

- Contrairement à la croyance commune, il n'y a eu aucune détérioration générale des résultats de la première cohorte à la dernière.

- L'écart entre les gains des hommes et ceux des femmes a diminué d'une cohorte à l'autre, mais les gains des femmes étaient beaucoup plus élevés lors de la première entrevue que lors de la deuxième, ce qui donne à penser que le rattrapage est moins important au cours de toute la carrière, que durant la période qui suit immédiatement l'obtention du diplôme.

Ce rapport fait partie d'une série d'études de recherche :

Earnings of Post-Secondary Graduates in Canada:

- *Holding Their Own – Trends in Employment Rates and Earnings Levels*
- *Changes in the Structure of Earnings in the 1980s and 1990s*

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1. Introduction

The headline is of a genre which has become commonplace: "Generation faces grim job outlook" (*The Globe and Mail*, Sept. 6, 1993), and runs over a story describing the by now familiarly bleak situation faced by younger workers entering the labour market. Of particular interest is that the article in question focuses on the plight of recent university graduates – a group which has traditionally fared well, but for whom, the story suggests, the bottom has dropped out almost as much as for less-educated younger workers.

"There is no car, no spacious apartment, no expensive vacations, no career" intones the article. One woman describes her own personal set of stunted expectations: "I can't imagine ever getting married, ever owning my own home, ever owning a car or ever having children. I'm just never going to have that." The article offers considerable anecdotal evidence regarding the difficulties of finding – and keeping – a job, and of the underemployment and low wages which characterise the "McJobs" which *are* obtained. A recent law graduate neatly sums up the alleged confusion and despair: "I think we're all a little lost. People just don't know what to do next."

Indeed, it seems to have become a received fact that "Generation X" has – as a whole – been facing tough times and has consequently sunk into a multifaceted collective malaise: cultural, moral, and political, as well as economic. But is the situation really as bad as this popular wisdom suggests? Or have the experiences of today's youth been exaggerated out of proportion owing to some combination of the media's search for a hot topic, a particular capacity for collective angst on the part of the generation in question, or perhaps preceding cohorts' sense of guilt for things done and/or not done? It is important to know what the real situation is, because only then can we know which policies – if any – should be brought to bear to assist this new "lost generation."

On the surface, the evidence seems incontrovertible, with various researchers – including this one – reporting a decline in the fortunes of younger Canadian workers, accompanied by

explanations of how this has come to be.[1] These studies have, however, mostly been restricted to the Survey of Consumer Finances (SCF) databases. One problem with this concentration of the empirical evidence is that there has been less cross-verification of the patterns than would be desirable – although the consistency of the SCF results with those based on other data sources which do exist is obviously significant in this regard.[2] Second, because the SCF is a general purpose labour market survey, the potential for doing extended analysis at the sub-group level—such as separating out different cohorts of recent post-secondary graduates and breaking the outcomes down by specific level of education and sex, and so on—is limited, due to the associated small sample sizes. Third, again due to the omnibus nature of the SCF databases, the variables available reflect no predilection for younger workers in general, or those going through the school-to-work transition in particular, thus limiting the scope of any analysis of this special stage of individuals' working lives. Fourth, the cross-sectional nature of the SCF data precludes any sort of explicitly dynamic analysis, such as how employment status or earnings levels evolve over the early years in the labour market for given individuals.[3] Finally, the SCF data pose problems for comparisons over time based on the specific level of education due to changes in the definition of the educational categories used in the survey in 1989.[4]

The contribution of this paper is, then, to offer new empirical evidence regarding the fortunes of younger workers by reporting the results of a cross-cohort, longitudinal analysis of the early labour market outcomes of Canadian post-secondary graduates carried out using the relatively under-exploited National Graduates Surveys databases.

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[1] Beaudry and Green [1997d], Beach and Slotsve [1996], Finnie [1997d], Morissette and Bérubé [1996], Morissette, Myles, and Picot [1995], Picot [1997], Riddell [1995], and Zyblock [1996] all report that the earnings levels of younger workers have declined in relative and/or absolute terms. Beaudry and Green, Morissette and Bérubé, and a series of papers by Finnie [1997a, b, c] indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed. In short, the age-earnings profiles of recent cohorts of younger workers appear to have both shifted downward and become flatter, thus indicating a decline in "lifetime" earnings. See OECD [1996] for an international perspective of the earnings of younger workers.

[2] The Finnie and Morissette and Bérubé papers use databases constructed from individuals' tax files.

[3] Beaudry and Green attempt to push the capacity of the SCF data beyond its inherently static nature by constructing synthetic earnings profiles from the various cross-sections. But while such constructions can be quite useful for many purposes, they can never be as good as true longitudinal data that follow given individuals over time.

[4] Beaudry and Green also develop useful means for dealing with the 1989 changes in the education categories to create classifications that are as consistent as possible over time, but are still left with an irresolvable margin of error in this regard (due largely to non-conventional educational pathways).

The NGS databases comprise large, representative samples of Canadian post-secondary students who successfully completed their college and university programmes in 1982, 1986, and 1990, and include detailed information on individuals' educational experiences and early labour market outcomes based on interviews conducted two and five years after graduation for each group. The NGS data thus facilitate a tightly focused and detailed dynamic analysis of the school-to-work transition of Canadian post-secondary graduates from the early 1980s into the mid-1990s, a period generally thought to be one of significant change in labour market outcomes – especially for younger workers. Sex and level of education (College, Bachelor's, Master's, Ph.D.) break down the analysis.

A central element of the analysis is to determine if early labour market outcomes have indeed deteriorated of late for post-secondary graduates in Canada. The evidence presented below suggests that this has *not* been the case – or at least not to the degree that some may have thought. More specifically, the most recent class of male graduates (those who graduated in 1990) generally had similar employment rates and in some cases moderately lower earnings than the first cohort (1982 graduates). Meanwhile, the middle group of graduates (those who finished in 1986) fared better than both these, having come onto the labour market during the boom years of the mid-1980s. Amongst female graduates, employment rates were also effectively unchanged, while earnings levels were generally *higher* for the most recent group, but more-so as of two years after graduation than five years out. The differences in outcomes by sex means that there was also a fairly significant narrowing of the gender earnings gap amongst graduates, but – interestingly – that this narrowing was much greater immediately following graduation than even just a few years later.

The paper is laid out in a very simple manner: the next section discusses the data, the empirical analysis follows, and the concluding section summarizes the major findings and offers some suggestions for future research.

2. The National Graduates Surveys

The specific sample selection procedures and key variable definitions are described in Appendix A, leaving this section to provide a general introduction to the relatively unknown National Graduates Surveys (and Follow-Up) databases.

The NGS databases, developed by Statistics Canada in partnership with Human Resources Development Canada, are well suited to this analysis for a number of reasons. First, the NGS files are representative of the underlying national population of college and university graduates and have abundant numbers of observations (over 30,000 individuals in each survey), thus facilitating the meaningful analysis of the post-graduation experience at a detailed level.[5, 6]

Second, the availability of data for three separate cohorts of graduates—those who completed their studies in 1982, 1986, and 1990—permits the compromise of outcomes over a period generally thought to be characterised by important changes in labour market outcomes, especially for younger workers, while also bringing the record as up to date as possible.[7]

Third, the NGS files are longitudinal, based on information gathered during interviews carried out two and five years after graduation for each cohort (1984/87, 1988/91, and 1992/95). This is allowing for a dynamic and relatively extended analysis of the school-to-work transition precisely situated as of two specific points in time relative to graduation.

Finally, the databases include a wide, interesting, and in some cases rather unique array of variables covering the educational experiences, general labour market outcomes, specific job characteristics, and basic demographic characteristics of graduates. This richness of information, however, only sets the broader context for the present paper, which concentrates on a few key

[5] A stratified sample scheme (by province, level of education and field of study) was employed. All results reported below reflect the appropriate sample weights. The databases also include trade and vocational school graduates, but these individuals are not included in the present analysis.

[6] Response rates were on the order of 80 percent for each of the first interviews and about 90 percent of these respondents were successfully interviewed a second time for each of the cohorts, resulting in 30,000-35,000 observations across the various years of data.

[7] The first survey of 1995 graduates has been carried out, but these data were not for analysis at the time this project was undertaken and will obviously lack the second interview data until those are collected in the year 2000.

labour market outcomes (activity rates and earnings levels), thus leaving the other elements of the file to be exploited elsewhere.[8]

In summary, the NGS data uniquely provide for a focused, detailed, and dynamic analysis of Canadian post-secondary graduates in the critical early years following graduation from the early 1980s into the mid-1990s.

[8] Related work which exploits these other aspects of the NGS data includes Finnie [1999b], a regression-based analysis of the cross-cohort earnings patterns; Finnie [1999a], a multidimensional profiling of the school-to-work transition which is focused on the evolution of outcomes from two to five years following graduation; Finnie [1999c], a descriptive analysis of differences in outcomes by discipline; and Finnie [1999d], an econometric analysis of differences in the level and variance of earnings by discipline.

3. The Empirical Findings

We begin with a discussion of some general trends in employment and earnings based on standard Labour Force Survey data for all workers – that is, not just recent post-secondary graduates. This provides the context for the analysis of recent post-secondary graduates which comprises the rest of the section, with a focus on: i) employment and earnings patterns by level of education and sex, ii) the evolution of these patterns from two to five years after graduation, and iii) shifts in these patterns across the three cohorts of graduates covered by the data.

3.1 The Context: General Trends in Unemployment Rates and Earnings Levels

3.1.1 General Unemployment Rates

Trends in unemployment rates based on standard Labour Force Survey data for the period 1982-95 – thus spanning the years covered by the NGS data used here – are shown in Figure A1 in Appendix B. The first point to notice is the well known empirical regularity that the rates are generally higher for younger workers than older ones. In 1995, for example men aged 20-24 had an unemployment rate of 15.0 percent, while men aged 25-34 had a rate of 10.2 percent and men of all ages taken together had a rate of 9.9 percent (the latter implying considerably lower rates for those aged 35 and older).[9] Women's unemployment rates were lower than men's in every case – an interesting fact in itself – but followed a similar pattern by age, with rates of 12.1, 9.3, and 9.2 respectively for each of the three age groups.

Regarding the trends over time, there were general increases in 1983 (after even sharper rises from 1981 to 1982); recovery through the rest of the 1980s; new increases during the early-1990s recession, with rates generally peaking in 1992; and subsequent improvements through 1995. Around these cyclical patterns, however – and perhaps contrary to popularly held views – there is little evidence of a general upward trend in unemployment rates over this period of time. For example, comparing 1983 and 1992, the years in which rates peaked, unemployment was lower in the latter period for men and women of all age groups, except men aged 25-34, for whom rates were slightly higher. Similarly, while younger workers generally had higher unemployment rates than older ones (as noted above), there was no significant general deterioration in their situation

[9] Unemployment rates of even younger men were highest of all (results not shown).

relative to older workers over the period. The unemployment rates of younger workers thus held more or less stable relative to the rates of workers of all ages taken together throughout the entire 1982-95 period).[10]

It is worth noting the following comparisons across the specific years corresponding to the NGS interview dates to provide the specific context for the cross-cohort analysis, which follows:

- For the comparisons based on the first interview conducted for each cohort (two years after graduation), men's (younger as well as older) unemployment rates were slightly higher for the third cohort (interviewed in 1992) than the first (interviewed in 1984), and distinctly lower for the middle cohort (interviewed in 1988). For women, the trends were broadly similar, but the 1992 rates were slightly lower (rather than slightly higher) than those which held in 1984, while the middle cohort again faced more favourable economic conditions than the others did.

- For the second interview for each cohort (five years after graduation), men's unemployment rates were uniformly lowest for the first cohort (interviewed in 1987), next lowest for the third cohort (interviewed in 1995), and the most elevated of all for the middle cohort (interviewed in 1991). For women, on the other hand, unemployment rates were generally quite similar across the three cohorts.

3.1.2 Earnings Levels

The mean earnings of workers of various age groups, again based on standard LFS data, are shown in Figure A2 in Appendix B. The figures are restricted to full-time workers in order to abstract from labour supply issues and to dove-tail with the NGS results reported below. The patterns are in some ways very consistent with the unemployment rates just seen, but are in other ways quite different.

Starting with men's earnings, there is no surprise that mean earnings were generally higher for older workers than younger ones, reflecting the well-known life-cycle pattern. Of greater interest, however, is that the time paths show much less cyclical variation than was the case for

[10] There were, however, increases in the absolute and relative unemployment rates of younger workers prior to the 1982-95 period covered here.

unemployment rates, while there was a moderate secular trend towards lower earnings for both the younger groups of men (aged 20-24 and 25-34) over the 1982-95 period – in both real terms, and relative to the earnings of older men, whose earnings exhibited no such general decline.

Younger women also show much less cyclical variation in earnings than was seen for unemployment rates, while the general trends over time were towards stability or moderate gains in real earnings levels, in contrast to the declines experienced by young men. The mean earnings of full-time female workers of all ages also rose.

For the cross-cohort comparisons, the following points are most salient:

- For the first interview data (1984/88/92), the second and third cohorts of male graduates found themselves in labour markets where the earnings of young men (aged 20-24, 25-34) were in each case slightly to moderately lower than those of the preceding wave, with the changes being more pronounced from the second cohort to the third. For women, the trends were in the opposite direction: increases rather than declines.

- For the second interview for each cohort (1987/91/95), younger men's earnings were again lower over time, although the timing and extent of the changes varied with the specific age group. For women, earnings trends were either relatively flat (those aged 20-24) or moderately upward (aged 25-34).

3.2 Activity Rates: The Evidence on Post-Secondary Graduates

3.2.1 Broad Activity Rates[11]

In showing the percentages of graduates who were employed (full- and part-time), unemployed, and out of the labour force (enrolled or not) by level of education and sex as of each of the two interview dates for the three cohorts of graduates, Table 1 provides a broad overview of what post-secondary students were doing in the years following graduation. These rates are based on samples which include graduates who had obtained another degree by the relevant interview date (graduates are, however, classified by their *original* degrees) – the only place in the analysis where this is the case. Note that the figures shown in this table are not conventional

[11] See Appendix A regarding the sample selection procedures and the activity rate definitions used here and below.

unemployment rates, as they represent the proportion of all graduates – including those out of the labour force – who were unemployed; standard rates based only on labour market participants (the more standard definition) are reported below.

Table 1: Activity Rates (% Distribution)

1982 Cohort

	1984					1987				
	Employed			NLF		Employed			NLF	
	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.
COLLEGE:										
Male	81	5	12	2	1	83	4	7	4	2
Female	75	12	9	1	3	72	15	5	3	6
BACHELOR'S:										
Male	76	6	9	6	2	85	5	4	4	2
Female	70	11	9	5	5	74	12	4	3	7
MASTER'S:										
Male	79	4	6	10	1	88	6	2	3	2
Female	71	10	8	7	4	74	13	3	3	6
DOCTORATE:										
Male	86	4	7	2	1	89	4	3	2	1
Female	80	6	8	1	5	82	9	2	3	4

1986 Cohort

	1988					1991				
	Employed			NLF		Employed			NLF	
	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.
COLLEGE:										
Male	82	4	11	2	1	83	3	10	3	1
Female	77	11	8	1	3	75	11	6	2	5
BACHELOR'S:										
Male	76	6	11	6	1	85	4	6	4	0
Female	70	12	9	5	3	75	12	5	3	4
MASTER'S:										
Male	76	6	6	10	1	86	5	4	4	1
Female	72	11	7	7	3	76	14	4	3	4
DOCTORATE:										
Male	89	4	4	1	1	95	2	2	0	1
Female	80	10	7	1	2	85	10	3	0	2

1990 Cohort

	1992					1995				
	Employed			NLF		Employed			NLF	
	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.
COLLEGE:										
Male	81	5	11	1	1	87	4	7	1	1
Female	73	12	10	2	3	74	14	7	1	5
BACHELOR'S:										
Male	76	6	10	6	1	85	4	6	4	1
Female	70	12	10	4	4	75	12	6	2	4
MASTER'S:										
Male	75	6	6	11	1	83	5	6	4	1
Female	73	10	7	6	3	75	11	5	3	4
DOCTORATE:										
Male	89	3	5	1	1	93	3	3	0	0
Female	83	6	7	1	2	82	8	6	0	4

In every case, by far the greatest proportion of post-secondary graduates were – not surprisingly – employed full time, with these rates generally rising from two to five years after graduation. Full-time employment rates were generally higher for men than women, while women held down more part-time jobs.

By level of education, full-time work was more common for Ph.D. graduates than those at other levels, reflecting the fact that such graduates have in most cases fully completed their schooling, are committed to being in the labour force, and have relatively abundant opportunities for employment, thus reflecting a number of demand and supply influences. Beyond this, the rates do not generally vary by level of education (College-Bachelor's-Master's) due to various cross-cutting influences: higher percentages of Master's and Bachelor's graduates are out of the labour force but still in school, enrolment has the further effect of increasing part-time employment at the expense of full-time employment, while College graduates typically have higher unemployment rates than those at the Bachelor's and Master's levels.

3.2.2 Employment and Unemployment Rates

Table 2 presents more conventionally defined labour force activity rates: the percentage of graduates employed full-time, employed part-time, and unemployed, with Figure 1 graphing the unemployment rates. Here, as henceforth, all graduates who had obtained an additional diploma by the relevant interview date are excluded from the calculations; continuing students who had not yet obtained a new diploma and who are in the labour force are, on the other hand, included.[12]

Unemployment rates were quite low for graduates of all levels (College through Ph.D.), sometimes as low as 2 percent, nowhere greater than 11 percent, and mostly in the 4 to 10 percent range. Furthermore, these rates are considerably below those of all labour force participants taken together (*i.e.*, post-secondary graduates as well as others) seen above. With the general rates for workers of comparable ages (20-24 and 25-34) ranging from 10 to 20 percent, thus implying rates considerably higher than these for non-post-secondary graduates taken alone. The graduates' rates also generally compare rather favourably to those of individuals of all ages

[12] A broader analysis of post-graduation activities, including the combination of work and school and the proportion of graduates who go on to obtain an additional degree, is included in Finnie [1999a].

taken together – thus further distancing college and university graduates from "the youth unemployment problem."

Table 2: Employment Rates (% Distribution)

1982 Cohort

	1984			1987		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	84	5	11	89	4	7
Female	79	12	9	79	16	5
BACHELOR'S:						
Male	85	6	9	92	4	4
Female	79	12	9	81	14	5
MASTER'S:						
Male	89	4	6	92	6	2
Female	80	11	8	81	15	4
DOCTORATE:						
Male	89	4	6	93	4	3
Female	87	6	7	89	9	2

1986 Cohort

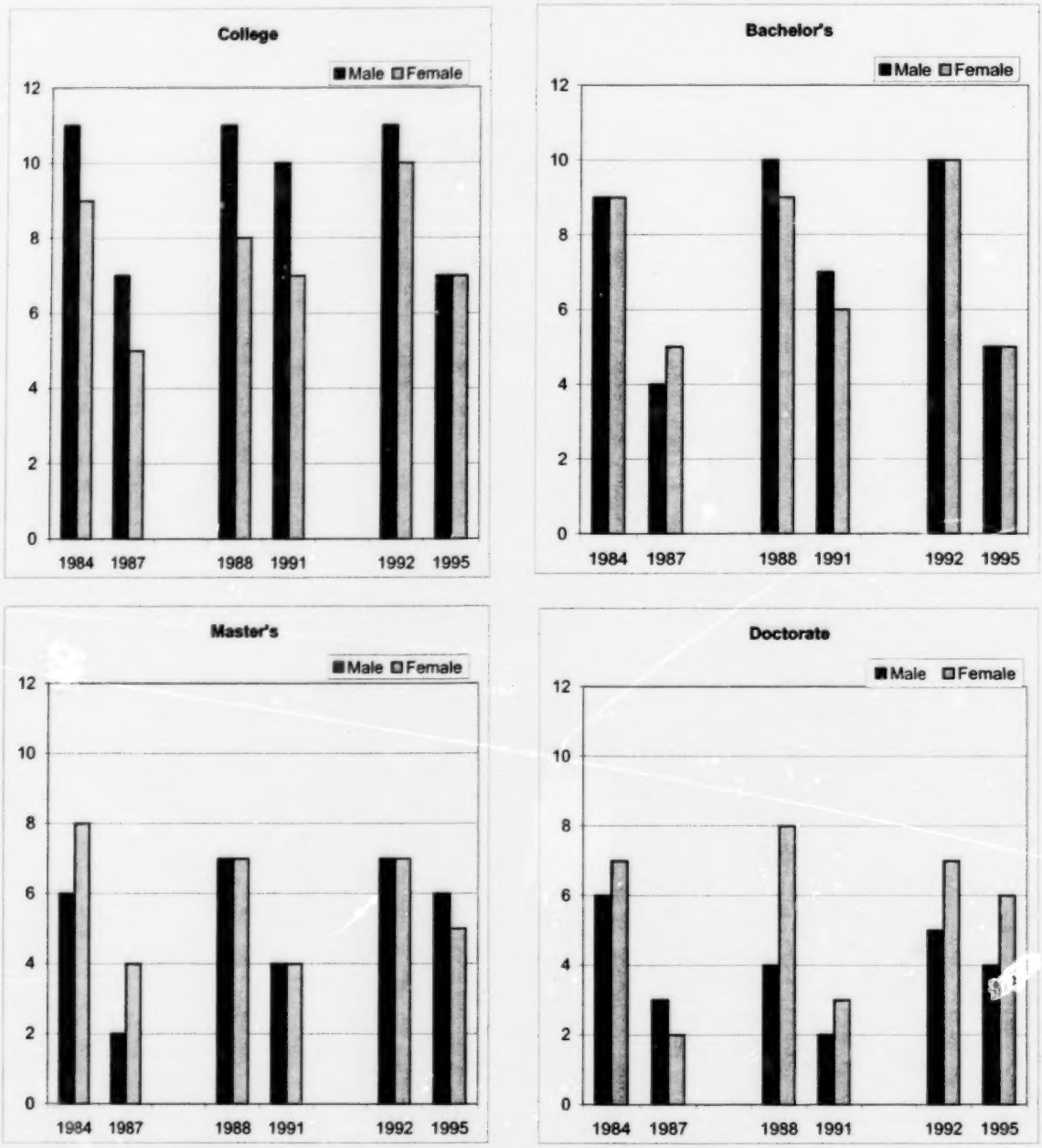
	1988			1991		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	85	4	11	86	4	10
Female	80	12	8	81	13	7
BACHELOR'S:						
Male	84	5	10	90	4	7
Female	78	13	9	81	14	6
MASTER'S:						
Male	87	6	7	90	6	4
Female	80	12	7	81	15	4
DOCTORATE:						
Male	91	4	4	96	2	2
Female	82	10	8	86	11	3

1990 Cohort

	1992			1995		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	84	5	11	90	4	7
Female	77	13	10	79	14	7
BACHELOR'S:						
Male	84	6	10	92	3	5
Female	78	13	10	82	13	5
MASTER'S:						
Male	86	7	7	89	5	6
Female	81	12	7	82	13	5
DOCTORATE:						
Male	92	3	5	94	3	4
Female	87	7	7	85	9	6

Note: Samples exclude graduates who had completed a new diploma by the relevant interview.

Figure 1: Unemployment Rates



Note: Samples exclude graduates who had completed another diploma by the relevant interview.

Second, the unemployment rates show only a very slight upward trend across cohorts, being generally stable or rising only one percentage point or so from the first to last set of graduates (by sex and degree level), and some of the later groups actually showing declines at either the two- or five-year interviews. Thus, in addition to enjoying unemployment rates that have generally been much lower than those of the general population enjoy enjoy, post-secondary graduates also appear to have experienced no significant general deterioration in employment opportunities from the early 1980s into the middle 1990s. This is an important finding – at least partly because it is likely to come as a surprise to many readers who have come to accept the "Generation X" idea in a wholesale fashion.

Also of considerable interest is that the unemployment situation has generally improved rather dramatically from two to five years after graduation, with unemployment rates everywhere declining, usually significantly so, and sometimes halving or dropping even further over the associated three year interval (*albeit* with some variation around these general tendencies by cohort, level of education, and sex). Thus, with respect to finding a job, the school-to-work transition appears to be very much a "process" – rather than a date-specific "event" – with this process evidently extending beyond the first couple of years following graduation, at least in terms of finding employment. These results also imply that any assessment of "how graduates are doing" which lacks the requisite longer-term perspective risks being quite misleading.[13]

By gender, certain patterns in unemployment rates are discernible, such as women tending to have lower unemployment rates than men at the College level, but higher rates at the Ph.D. level for the later two cohorts. Such patterns might indicate the existence of associated gender differences in the "returns to higher education" in terms of employment opportunities.[14] The observed patterns are, however, neither particularly flagrant nor perfectly uniform, and there are no obvious general differences at the Bachelor's or Master's levels at all, suggesting that such conjectures should be made with care.

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[13] The "transition" notion is the central theme in Finnie [1999a]. See Betts, Ferrall, and Finnie [1998] for an analysis of the specific issue of time to first job.

[14] A more complete analysis of the advantages of post-secondary diplomas in terms of employment opportunities would obviously require a much more extensive set of comparisons, including controls for factors apart from level of education and sex which are related to employment rates. Calculating the relative returns at the College and Bachelor's levels would, furthermore, require comparisons with non-post-secondary graduates.

As for part-time work, the most obvious pattern is that, as noted above, it is much more common amongst women than men – at all levels of education and at all points in time. Over the post-graduation years, the proportion of women with part-time jobs has tended to rise, primarily reflecting labour supply decisions related to having and raising children, while part-time work on the part of men has sometimes risen and sometimes fallen from two to five years after graduation, presumably reflecting different life cycle forces as well as shifting current demand conditions (*i.e.*, the availability of full-time work). By education level, there has been a tendency for Ph.D. graduates to have lower rates of part-time work than other graduates, especially for women, but there are no clear patterns across the other groups.

Probably the most remarkable finding regarding part-time work is, however, probably the *absence* of any clear cross-cohort patterns. At a time when it is often taken for granted that there have been significant increases in the rates of "non-standard work" in general, and part-time work in particular – and where these are typically assumed to represent demand-side forces (*i.e.*, the absence of full-time job opportunities), the data provide no empirical evidence of this phenomenon amongst post-secondary graduates. Indeed, comparing the first and last set of graduates, there were more declines than increases in the percentage of part-time workers amongst the various sex-education groups from the first cohort to the last one.

3.3 The Earnings Patterns of Graduates

3.3.1 Mean Earnings by Education Level

Table 3 reports the mean real earnings of graduates (in 1995 dollars) who were working full-time as of the relevant interview dates, while Figure 2 provides the corresponding graphs.[15] The first

[15] The analysis focuses on full-time workers in order to abstract from labour supply decisions as much as possible. While the restriction to full-time workers allows us to focus on demand side effects – what might be considered the underlying "structure" of earnings faced by graduates – it is also recognized that part-time employment status is sometimes the result of a lack of full-time opportunities, rather than the employee's preferred status, thus potentially "biasing" the earnings measures upwards. The elimination of continuing students working part-time from the analysis is particularly desirable because such individuals have generally not really begun the school-to-work transition in earnest, with an ancillary analysis having shown that most "student workers" were in fact full-time students and part-time workers, and were the latter precisely because they were the former – that is, they were primarily students, and only secondarily workers, and should, therefore, not be included in this study of "labour market outcomes" (*e.g.*, many of those who *could* have had high earnings levels had chosen to take relatively low paying part time jobs as they pursued further studies). The deletion of part-time workers is especially important in a context where the number of such workers varies significantly by age-sex group and survey year (Tables 1 and 2), meaning that their inclusion would result in an entanglement of demand and supply influences with respect to earnings comparisons across groups and over time – including the cross-cohort analysis which is central to this paper. In summary, the restriction to full-time workers adopted here allows us to focus on the earnings opportunities faced by graduates, with the analysis of

observation to make is the rather unsurprising one that mean earnings are generally higher at each level of education from College through the Bachelor's degree to the Master's. The precise magnitude of these differences is, however, perhaps more interesting, as the NGS data allow us to observe the patterns for each sex-education group at two specific points in time following graduation (two and five years after) for the three different cohorts of graduates. Over all points in time, the difference in annual earnings between College and Bachelor's graduates ranges from $6,000 to $10,200, averaging approximately $8,300 for men and $8,700 for women. The differences between Bachelor's and Master's graduates were generally greater, ranging from $10,000 to $14,000, averaging $12,700 for men and $11,300 for women.

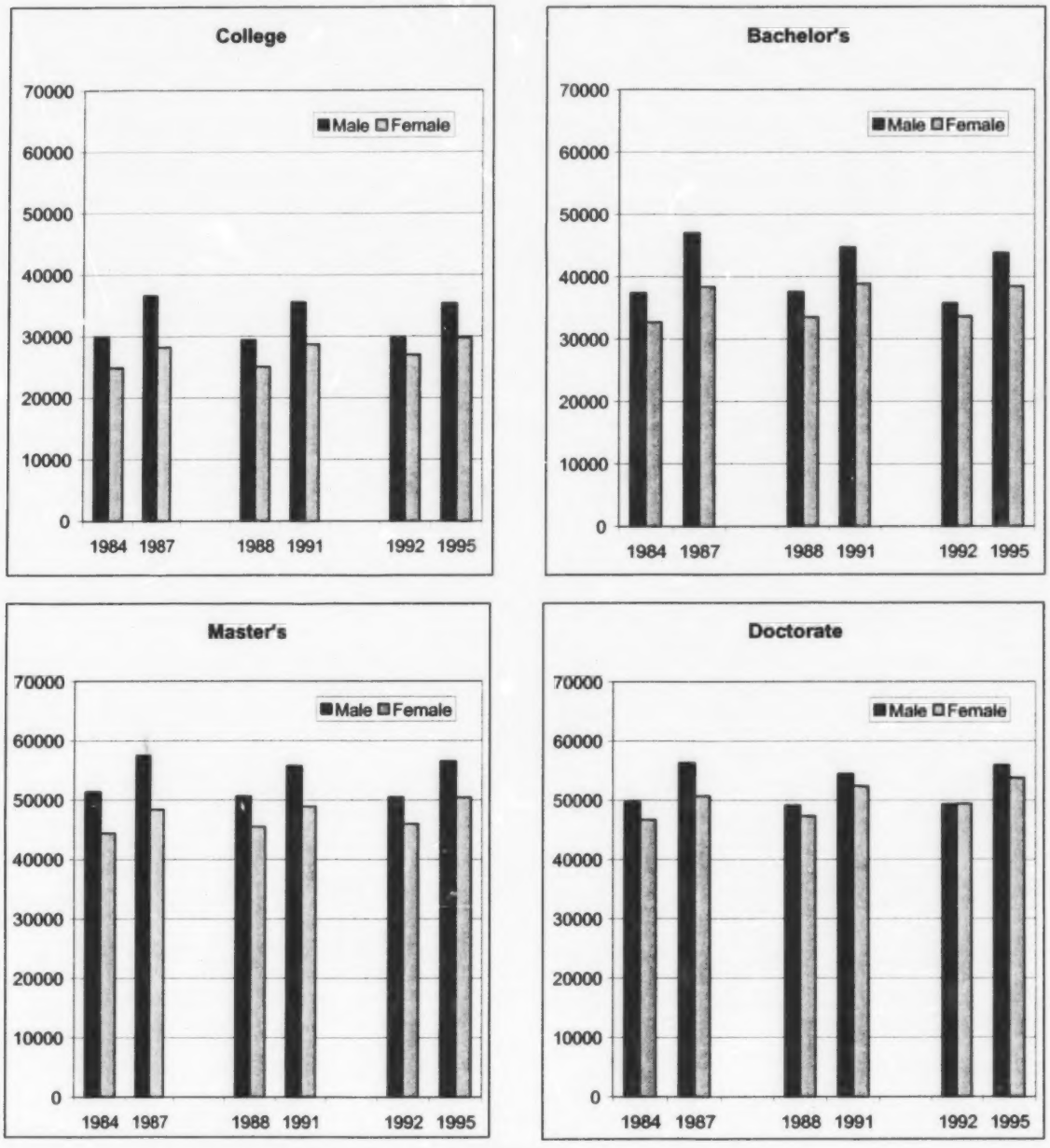
Table 3: Mean Earnings (1995 Constant Dollars)

	1982 Cohort			1986 Cohort			1990 Cohort		
	2 Years (1984) $	5 Years (1987) $	Change (84-87) %	2 Years (1988) $	5 Years (1991) $	Change (88-91) %	2 Years (1992) $	5 Years (1995) $	Change (92-95) %
COLLEGE:									
Male	29,700	36,600	23	29,400	35,500	21	29,700	35,300	19
Female	24,900	28,200	13	25,100	28,700	14	27,000	29,700	10
Female/Male (%)	84	77		85	81		91	84	
BACHELOR'S:									
Male	37,400	47,000	26	37,600	44,700	19	35,700	43,800	23
Female	32,700	38,400	17	33,500	38,900	16	33,600	38,500	15
Female/Male (%)	87	82		89	87		94	88	
MASTER'S:									
Male	51,400	57,500	12	50,600	55,700	10	50,500	56,500	12
Female	44,400	48,400	9	45,500	48,900	7	46,000	50,400	10
Female/Male (%)	86	84		90	88		91	89	
DOCTORATE:									
Male	49,700	56,300	13	49,100	54,400	11	49,300	55,900	13
Female	46,700	50,700	9	47,300	52,400	11	49,400	53,800	9
Female/Male (%)	94	90		96	96		100	96	

Note: Samples exclude graduates who had completed another diploma by the relevant interview. The calculations of the mean earnings omit individuals with reported earnings below $5,000. Earnings have been truncated to $143,035.

employment opportunities *per se* captured in an overall fashion by the activity rates shown above. (See Finnie [1998b] for further analysis of part-time work, including: i) a break-down of part-time workers into those doing so voluntarily or not, and ii) the evolution of part-time work patterns from two to five years following graduation, including individual level dynamics.

Figure 2: Mean Earnings (1995 Constant Dollars)



Note: Samples exclude graduates who had completed another diploma by the relevant interview.

Finally, at the Ph.D. level, mean earnings generally dipped slightly from what Master's graduates earned in the case of men (except 1995, when earnings were basically equal), while they rose further for women. Taking into account the generally lower earnings levels of women, these absolute dollar patterns indicate greater rates of return to obtaining a Bachelor's degree (relative to a College diploma) or a Ph.D. degree (relative to a Master's) for women than men, and comparable rates of return on going on to a Master's degree (relative to a Bachelor's).[16]

3.3.2 Earnings Growth in the Post-Graduation Years

A second important general finding is that mean earnings generally rose substantially over the early years in the labour market – seen here as the changes from two to five years after graduation (the two interview dates). The percentage increases, shown in the relevant columns in the table, vary from a minimum of 7 percent for 1986 female Master's graduates to as much as 26 percent for 1982 male Bachelor's graduates.

Interestingly, earnings growth was uniformly greater for College and Bachelor's graduates than at the Master's and Ph.D. levels (in percentage terms – growth rates in dollar terms were roughly similar), the latter thus being characterised by higher, but flatter, post-graduation earnings profiles – not necessarily what would have been predicted.

3.3.3 Gender Patterns in Earnings

A third set of findings pertains to gender patterns. To begin, mean earnings were in every case higher for males than females, with women's mean earnings varying from 77 percent to 100 percent the level of men's for a given education group in a given year (see the "Female Ratio" rows in Table 3). The differences generally vary inversely with education level, with women's earnings being closest to men's amongst Ph.D. graduates, next nearest at the Bachelor's and Master's levels, and lagging furthest behind amongst College graduates.

On the other hand, women's relative earnings rose in each succeeding cohort – for each education group at each of the interview dates (*i.e.*, in each case the female-male earnings ratios as of two and five years after graduation were higher in each succeeding cohort: from 84 to 85 to 91 percent in the case of College graduates at the first interview, and so on). Indeed, the gender

[16] The proper calculation of such rates of returns is a fairly complex exercise, but these "back-of-the-envelope" numbers are interesting first cuts which should at a minimum provide a useful starting point for such investigations.

earnings gap narrowed significantly over this period, generally declining by 30-55 percent from the first cohort to the third amongst College, Bachelor's, and Master's graduates. In the case of College graduates, the earnings gap as of the first interview date narrowed from 16 to 9 percentage points (the female ratio went from 84 to 91 percent), thus representing a 44 percent diminution of the gap. The earnings gap was completely eliminated amongst Ph.D. graduates as of the two-year interview, although the gap was down an obviously smaller 60 percent as of the second interview date.

Along the other time dimension, however, the NGS data permit us to see quite precisely that men's mean earnings rose more than women's from two to five years following graduation for every set of graduates except Ph.D. graduates of the middle cohort. Furthermore, in most cases the gender differences in earnings growth were substantial (see the relevant columns in Table 3), meaning that the gender earnings gaps widened significantly in the years following graduation in both relative (again see the "Female Ratio" rows in the table) and absolute dollar terms. This was especially true amongst College and Bachelor's graduates. The male-female differences in mean earnings were, therefore, not only generally greater at these levels (see above), but also increased more sharply over the early years in the labour market than was the case for Master's and Ph.D. graduates.

Finally, while the male-female differences in mean earnings were generally smaller in the later cohorts (noted above), the differential growth rates did not generally change in a similar manner. This implies that the gender earnings gaps which exist for the later cohorts may continue to widen in the post-graduation years more or less as much as was the case with the earlier sets of graduates.

That is, we have the interesting and important finding that while the gender earnings gaps amongst post-secondary graduates narrowed across cohorts, it would appear that these were "ratchet"-like cohort effects related to the earnings *levels* of each group of graduates. Meanwhile the gaps have continued to increase from those new (lower) levels in the post-graduation years about as much for the most recent graduates as the earliest ones.

In short, while female graduates' earnings profiles appear to be shifting up towards male graduates' profiles with each succeeding cohort in terms of the starting *levels*, the relative *slopes*

of those profiles do not appear to have changed commensurately. Whether this is due to the specific types of human capital investments (field of education, post-graduation labour market experience, and so on), labour supply factors, direct labour market discrimination, or other factors cannot be answered by these data. This finding also places recent "affirmative action" policies in an interesting light, as they suggest that such initiatives may have contributed to a significant narrowing of starting salary differences but have had very little effect on subsequent earnings growth, thus attenuating their effects in the longer run.[17]

3.3.4 Cross-Cohort Earnings Patterns

Most important to the major themes of this paper, however, are the patterns across cohorts for given sex-education groups. Focusing on the first and last sets of graduates (recalling that the relevant two year (1984/92) and five year (1987/95) interview dates were at roughly comparable points in the business cycle), men's mean earnings were stable to moderately lower for the later graduates, varying with the specific educational level and interview year. The specific changes were as follows: no change (two years after graduation) and a 3.6 percent decline (five years) for College level men; declines of 4.5 and 6.8 percent – the sharpest drops – for Bachelor's graduates; more moderate declines of 1.8 and 1.7 percent for Master's men; and almost negligible changes of .8 and .7 percent for males at the Ph.D. level.[18]

For women, on the other hand, mean earnings were uniformly higher amongst graduates of the later cohorts than the earlier ones, in some cases quite substantially so. Furthermore, in almost every case, the increases came steadily over time, with earnings first rising from the first cohort to the second and then from the second to the third (the only exception is the 1 percent decline in the mean earnings of Bachelor's graduates from 1991 to 1995). The specific increases from the first cohort to the third were: 8.4 (two years after graduation) and 5.3 percent (five years after graduation) for College level women; 2.8 and .3 percent (the smallest increases) for females at

[17] See Finnie and Wannell [1999] for further analysis of these issues.

[18] Note that these mean earnings figures are based on samples, which are allowed to change from the first interview to the second, with individuals included as long as they meet the sample restrictions in the relevant year. This should generate results, which are most representative of the underlying population of workers in each period, meaning that the associated cross-cohort comparisons should be similarly representative. Finnie [1999a] also presents figures where the samples are restricted to individuals who met the sample selection criteria in *both* periods (being interviewed, being a full-time worker, *etc.*). The advantage of the latter approach is that earnings comparisons from the first interview to the second are not confounded by any "composition effects" related to changed samples, but this comes at the potential cost of diminished representativeness in any given year related to the "two interview" selection rule. In any event, the "fixed sample" results are qualitatively quite similar to those reported here – while varying quantitatively to some degree.

the Bachelor's level; 3.6 and 4.1 percent for Master's graduates; and 5.8 and 6.1 percent for Ph.D. women.

We can now see that it was as a result of these cross-cohort declines in the mean real earnings of men and the increases registered by women that the female-male earnings ratio rose from the first cohort to the second, and again to the third. This was true for all education groups at each interview point (two and five years after graduation).

3.3.5 Median Earnings and Related Distributional Patterns

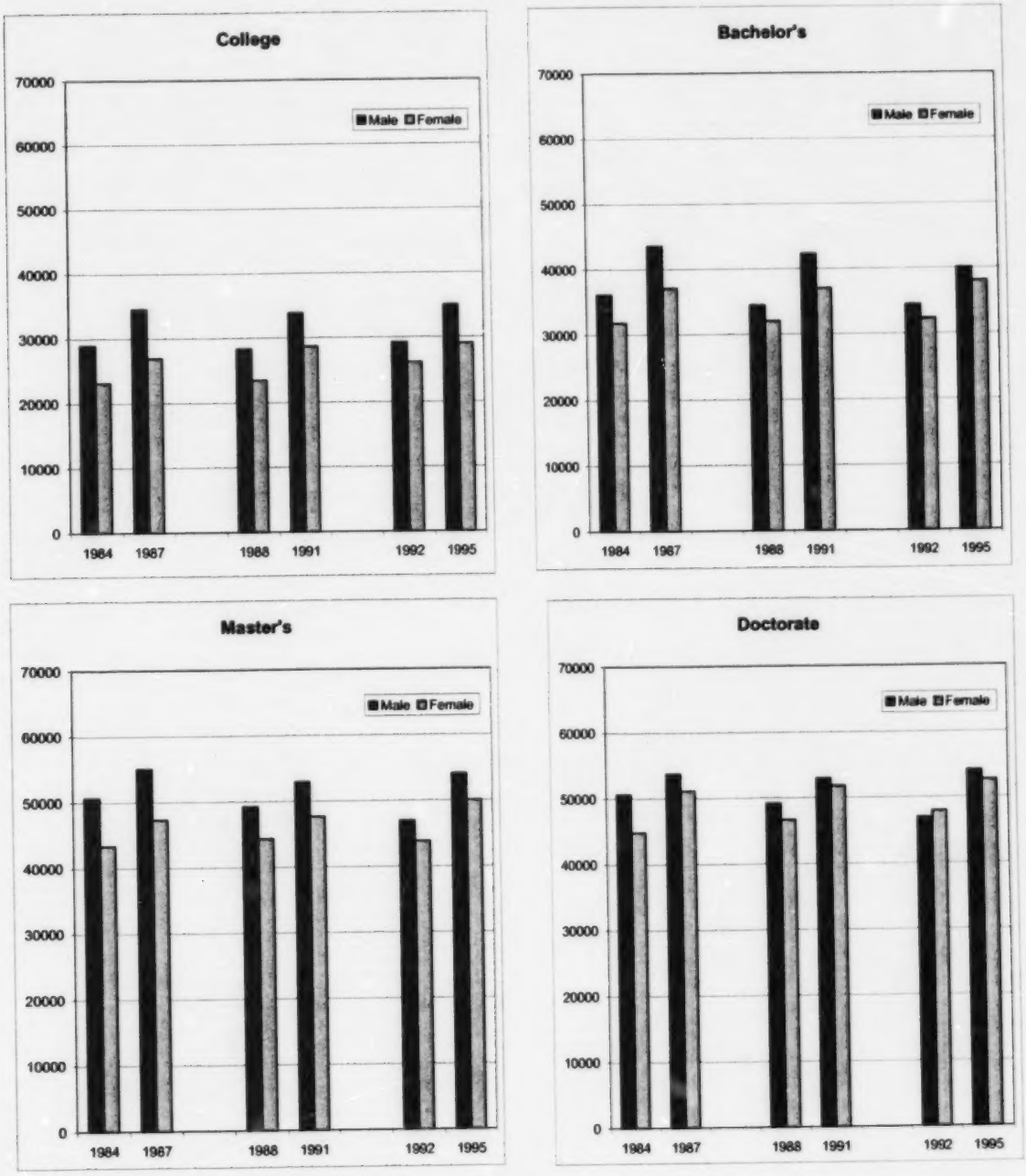
The median earnings patterns, shown in Table 4 and Figure 3, are generally similar to the means, but there are also some interesting differences which imply something about the shape of the underlying earnings distributions of each sex-education group and the changes in earnings over time across the different ranges of these distributions.

Table 4: Median Earnings (1995 Constant Dollars)

	1982 Cohort			1986 Cohort			1990 Cohort		
	2 Years (1984) $	5 Years (1987) $	Change (84-87) %	2 Years (1988) $	5 Years (1991) $	Change (88-91) %	2 Years (1992) $	5 Years (1995) $	Change (92-95) %
COLLEGE:									
Male	28,900	34,500	19	28,300	33,800	19	29,200	35,000	20
Female	23,100	26,900	16	23,400	28,600	22	26,100	29,000	11
Female Ratio (%)	80	78		83	85		89	83	
BACHELOR'S:									
Male	36,100	43,500	20	34,400	42,300	23	34,400	40,000	16
Female	31,800	37,100	17	32,000	37,000	16	32,300	38,000	18
Female Ratio (%)	88	85		93	87		94	95	
MASTER'S:									
Male	50,600	55,000	9	49,200	52,900	8	46,900	54,000	15
Female	43,300	47,300	9	44,300	47,600	7	43,800	50,000	14
Female Ratio (%)	86	86		90	90		93	93	
DOCTORATE:									
Male	50,600	53,700	6	49,200	52,900	8	46,900	54,000	15
Female	44,800	51,100	14	46,700	51,800	11	47,900	52,600	10
Female Ratio (%)	89	95		95	98		102	97	

Note: Samples exclude graduates who had completed another diploma by the relevant interview. The calculations of the med earnings omit individuals with reported earnings below $5,000. Earnings have been truncated to $143,035.

Figure 3: Median Earnings (1995 Constant Dollars)



Note: Samples exclude graduates who had completed another diploma by the relevant interview.

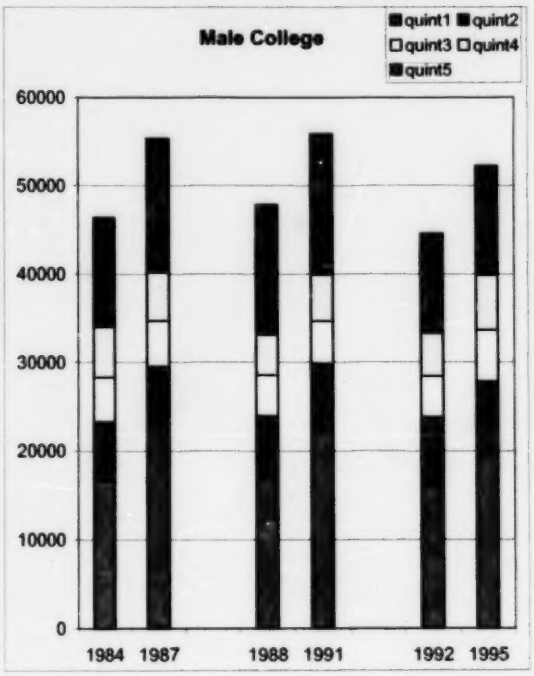
These median results need, however, to be interpreted with some caution. Since the fact that earnings are rounded to the nearest thousand, certain small differences in the underlying distribution of earnings (across groups or over time) could lead to exaggerated differences in the medians, while in other cases differences in the distribution of earnings might be under-represented by the medians. Such effects could be especially strong when looking at changes over time.[19] We will, therefore, in some cases look at the patterns of mean earnings by quintile for each sex-education group, shown in Figure 4, along with the medians, in order to identify any interesting earnings patterns pertaining to the within-group distributions.

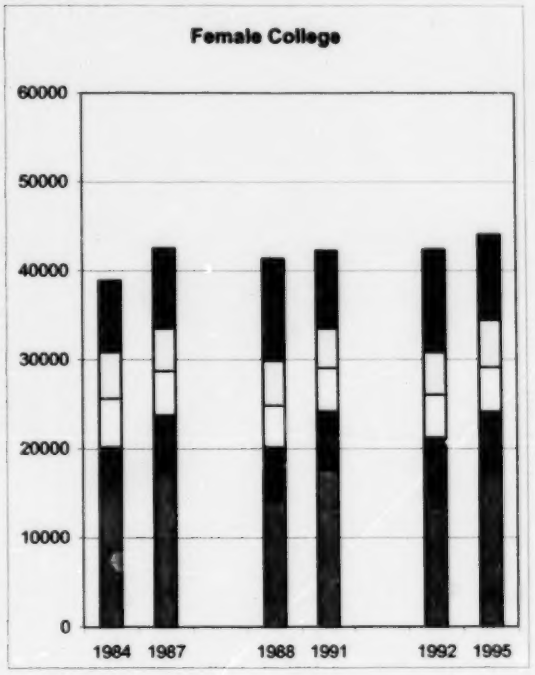
To begin, average earnings as measured by the median are – as with the means – seen to rise with the level of education except from the Master's degree to the Ph.D. for male graduates. Other results repeating from the means is that median earnings are generally higher for men than women; that the gender earnings gaps are smallest amongst Ph.D. graduates, next narrowest at the Master's and Bachelor's levels, and greatest amongst College graduates. Also, women did some significant catching up to men from the first cohort to the second, and again from the second to the third, with women's median earnings actually surpassing men's at the Ph.D. level in 1992 (but no longer in 1995).

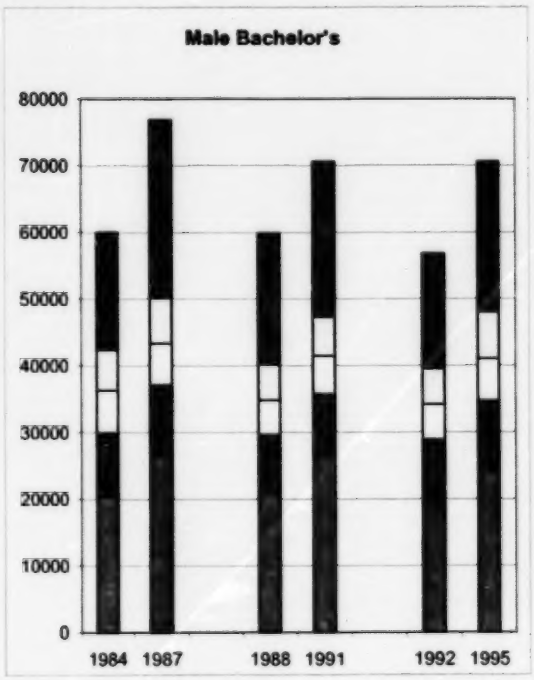
[19] For example, in the most extreme case, the median individual could have a one dollar increase in earnings which took the person over the threshold to the next one thousand dollar mark, thus shifting the median measure commensurately. While in another case, the underlying earnings distribution could shift up or down to a significant degree with no change in the measured median (depending on the changes that were occurring at the very middle of the distribution). In short, the rounded annual earnings figures mean that medians are in many ways likely to be less robust than means. The resulting margin of error could be especially significant when calculating percentage changes in earnings over time. For example, a $1,000 difference would shift the measured growth rate by over 4 percent for the lower earnings groups, and still as much as almost 2 percent for the groups with the highest earnings – with these margins of error being large relative to the true growth rates. Both the overall group medians and the mean earnings by quintile measures are prone to be affected by these margins of error.

It should be noted that while earnings figures were in fact rounded in the raw NGS data in every year except 1995, an analysis of that other year's data indicated that most individuals gave earnings figures rounded to the nearest thousand themselves, that mean earnings levels are unlikely to be greatly affected by the rounding imposed in the other survey years (imposing a similar rule on the 1995 data left the means virtually unchanged), that medians appear to be slightly more sensitive to that rounding (imposing the rounding rule generated greater differences), but that the greatest problem with respect to median calculations is likely due to individuals' own rounding of the earnings figures they provided rather than the rounding exercise carried out during the collection of the data.

Figure 4: Mean Earnings by Quintiles (1995 Constant Dollars)







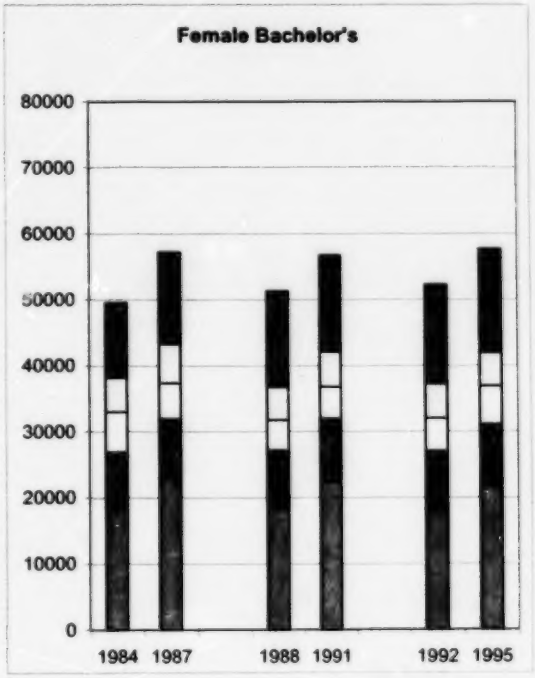


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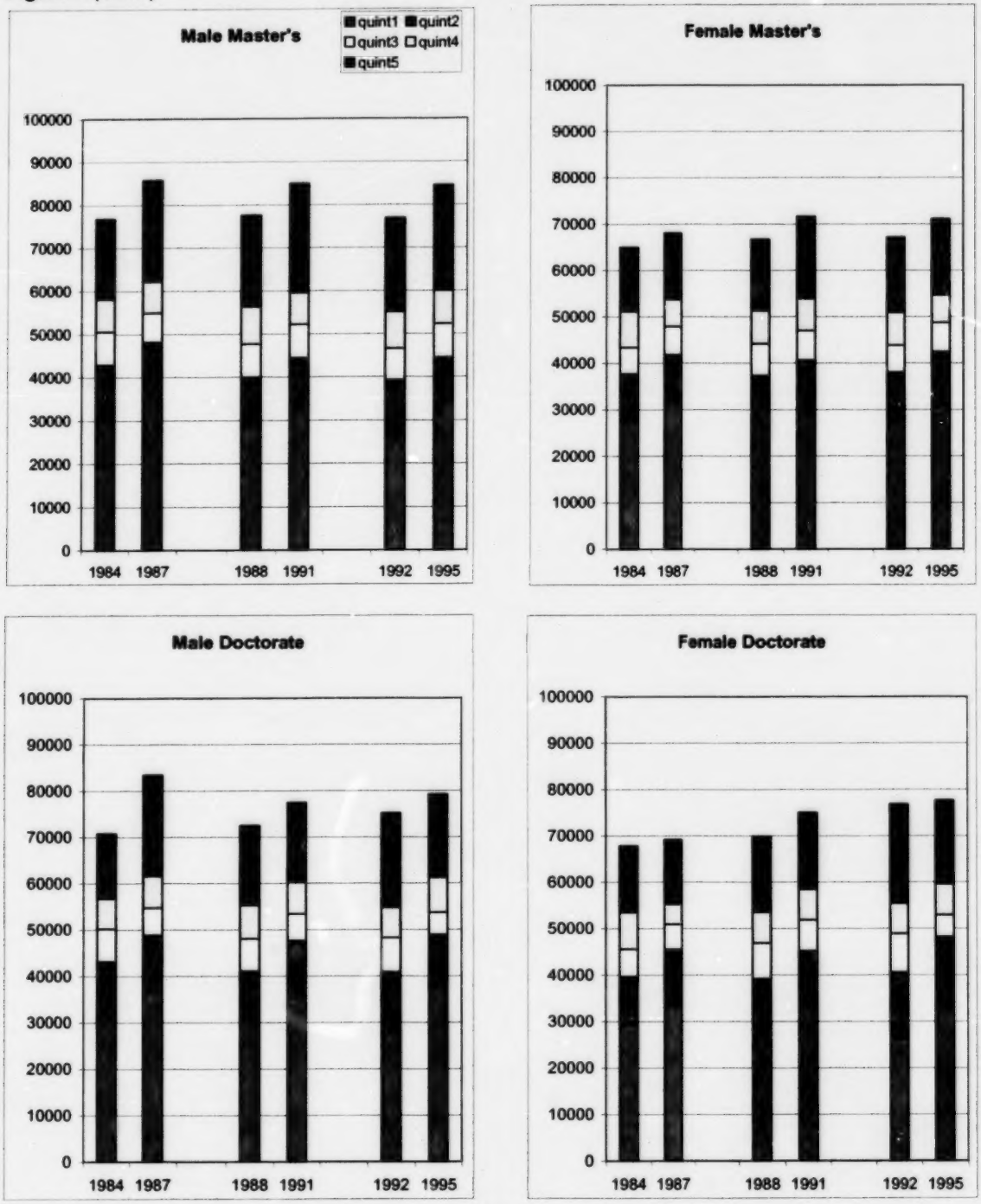
Figure 4 (Cont.)



Note: Samples exclude graduates who had completed another diploma by the relevant interview.

Median earnings also rose substantially from two to five years after graduation. Perhaps more interesting, is that the increases in median earnings for female graduates were in every case greater than or equal to the increases in their means (see the columns showing the percentage changes in Tables 3 and 4). This was not the case for men, for whom the median increases were in many cases smaller than those of the means, especially in the two earlier cohorts. As a result, the increases in women's median earnings from two to five years after graduation were generally closer to the men's increases than was the case with mean earnings (the only exceptions being Bachelor's graduates of the middle cohort and Ph.D. graduates of the third cohort). And in some instances, the female growth rates even surpassed the males' (*i.e.*, 1982 and 1986 Ph.D. graduates, 1986 College graduates, and 1990 Bachelor's graduates).

Thus, whereas the gender earnings gap based on mean earnings widened from two to five years after graduation in almost every case (excepting only Ph.D. graduates of the middle cohort), the gap generally widened less, or even became smaller (the four cases noted in the preceding paragraph), according to the median measures in all cases except the two noted above. It should be emphasized, however, that men's earnings remain everywhere greater than women's according to the median measures, except again the case of the most recent cohort of Ph.D. graduates as of the first interview.

These mean-versus-median results thus provide an interesting alternative perspective of the evolution of the gender earnings gap over the early years in the labour market. In particular, they suggest that the changes in earnings following graduation were in most cases relatively more concentrated in the middle and lower earnings ranges for women than was the case for men – an interesting finding. That is, there appears to have been greater equality with respect to the increases in earnings amongst women than men. Otherwise put, it appears that more male graduates have been characterised by higher-than-average earnings increases relative to their fellow graduates than has been the case for women – "fast tracking" has, apparently, generally been more of a male than female phenomenon.[20] On the other hand, the relatively unrobust

[20] This is perhaps especially interesting when we observe that the mean versus median comparisons indicate that earnings *levels* do not appear to have been generally more equally distributed amongst women than men: women's relative earnings are not generally closer to men's according to the medians rather than the means.

nature of the median measures as applied to the NGS data suggest that further investigation of this issue be required before more categorical statements can be made along these lines.[21]

3.3.6 Median and Quintile Earnings in a Cross-Cohort Context

Perhaps most important for the central cross-cohort theme of this paper, the changes in median earnings from the earlier graduates to the later ones were generally in the same direction and of approximately the same magnitude as the means. Thus, the median earnings of the 1990 cohort of men were at similar or lower levels relative to those of the class of 1982, with roughly similar patterns by education level and particular interview year. While for women, median earnings were uniformly higher in the later cohorts than the earlier ones, and sometimes quite substantially so. As with the means, the 1982-90 cohort changes favoured female graduates over male ones (for a given education level) in every case.[22]

Putting these mean-versus-median comparisons together with the mean earnings levels by each within-group (*i.e.*, sex-education) quintile (Figure 4) provides a more detailed view of the shifts in the distributions over time. In most cases, the changes were in fact relatively uniform across the entire earnings distribution. For example, Bachelor's level men showed similar declines by the means, the medians, and the detailed quintile changes, which varied from 3.6 to 8.4 percent for the first interview, and from 4.2 to 8.8 percent for the second interview. The more notable

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[21] This part of the analysis is principally based on the simple rule of thumb that a greater increase in the median than the mean generally indicates a greater increase in earnings amongst those in the lower parts of the distribution than those with higher earnings to begin with. On the other hand, the median really only tells us about the very middle of the distribution, and we have noted above that the median calculations using the rounded earnings figures available in the NGS data might lack robustness. Hence the caution regarding the interpretation of the findings – which are, nevertheless, both interesting and of some validity due to their general nature (*i.e.*, they hold for most groups in most cohorts).

[22] The mean-median differences that show up are presumably at least partially due to the effect of the rounded earnings values on the median calculations. Starting with men, the median changes were, specifically, increases of 1 percent (two and five years after graduation) and 1.5 percent (five years after) at the College level, as opposed to the unchanged level and a decline of 3.6 percent registered with the means; declines of 4.7 and 8.1 percent – again the greatest drops – for Bachelor's graduates, quite close to the declines of 4.6 and 6.8 percent in the means; declines of 7.3 and 1.8 percent for Master's men, the former considerably greater than the 1.8 percent decline of the mean, the latter almost identical to the 1.7 fall-off of the mean; and declines of 7.3 and .6 percent for men at the Ph.D. level, the first interview value again departing from the decline of -.8 percent in the mean and the second value again very close to the -.7 percent decline in the mean. For women, the first-to-last cohort increases – and they were all increases – were 13.0 and 7.8 percent (two and five years) at the College level, greater than the 8.4 and 5.3 percent increases seen for the means; 1.6 and 2.4 percent amongst Bachelor's graduates, quite close to the 2.8 and .3 percent of the means; 1.2 and 5.7 percent at the Master's level, again fairly similar to the 3.6 and 4.1 percent of the means; and 6.9 and 2.9 percent for Ph.D. women, as compared to the 5.8 and 6.1 percent increases in the means.

differences include male graduates at the Master's level, amongst whom those at the top of the earnings distribution did much less badly than those at the bottom.

More interesting is that the female increases seem to have favoured those at the higher earnings levels over those at the lower levels to some degree – this generally holding at all four levels of education and at each point in time. The median and mean measures thus appear to conceal a certain "polarization" of earnings amongst female graduates of a given education level, with generally more substantial increases at the top than at the bottom.

4. Conclusion

This paper has provided an analysis of the employment and earnings patterns of recent post-secondary graduates based on three waves of the National Graduates Surveys. The major findings regarding labour force activity rates include that graduates at all levels have generally had unemployment rates which have been below those of non-graduates, which have improved significantly from two to five years following graduation, and which did not deteriorate for the later cohorts relative to the earlier ones. Amidst relatively predictable patterns by level of education and sex, neither have rates of part-time work generally shifted to any noticeable degree over time.

With respect to earnings, we have again seen the general pattern of significant improvements in the years following graduation. But perhaps the most important set of findings is that the average earnings of male graduates of the more recent cohorts have either held steadily or shown small-to-moderate declines relative to earlier groups, while women's earnings have either risen or remained stable. These combined effects result in steady decreases in the various gender earnings gaps (by level of education and year) over the last decade or so. The median and more detailed distributional results are broadly consistent with the major findings of the means, but have provided additional detail, even if only in a somewhat conjectural fashion due to the limitations of the data.

Thus, as regards the principal question regarding "Generation X," while the maximum decline in mean earnings of just under 7 percent found for the Bachelor's level men is hardly trivial, it is perhaps not as great as many might have expected, especially in representing the worst case amongst all sets of results for all groups of graduates. Furthermore, the stability-cum-improvements experienced by female graduates would presumably be received as good news in a context where discussions are often predicated on the stylised fact that there have been significant declines. The fact that these earnings findings are supported by relatively stable employment rates lends robustness to the results.

Appendix A

The Samples

Construction of the Working Samples

Except for an initial analysis of post-graduation activity rates, graduates who obtained an additional degree by one of the two interviews were deleted from the analysis at that point.[23, 24] This was done on the grounds that such graduates no longer belonged to the original education group (*e.g.*, a Bachelor's graduate might have become a Master's graduate). In any event, they had been mixing school and work in a way likely to affect the labour market outcomes upon which this analysis is focused. Including later graduates would also throw off the precise post-graduation time frame corresponding to the two interview dates (*i.e.*, two and five years after graduation) which holds for the "schooling finished."

In the earnings analysis, the samples were further restricted to full-time workers only, thus focusing the exercise on those with significant labour market attachment and allowing the analysis to abstract from labour supply decisions that could affect earnings patterns. In particular, most continuing (full-time) students were eliminated from the samples by this condition; desirable for reasons similar to those given for the deletion of those with new diplomas just

[23] That is, graduates who had obtained a new degree/certificate/diploma by the first interview were deleted from both periods' analysis, while those who obtained a new diploma only by the second interview were included in the analysis of the first period situation (as long as they met the other selection criteria) but not the second. This selection procedure resulted in samples which are as inclusive as possible for each survey year. This is especially important in a context where going on to further schooling could be related to early labour market outcomes, a hypothesis which finds support in the case of engineering graduates in Finnie and Lavoie [1997].

[24] Essentially all formal post-secondary degree/certificate/diploma programmes were considered in this selection. Exceptions include the following: "interest"/recreation-type courses, which typically do not represent any sort of formal human capital investment and which should not generally have a direct effect on early labour market outcomes; banking and insurance certificates, which are normally gained largely as a matter of a course by those on certain career paths; non-professional health certificates which, by their very designation, are not generally career related; high school diplomas, which are deemed to largely represent an accreditation formality without direct effects on labour market outcomes for those already possessing post-secondary diplomas; and registered apprenticeships, which are again seen to be part of a normal career path rather than additional formal schooling **per se**. Thus, graduates who received any of these diplomas since graduation from the original programme were included in the analysis and such qualifications were effectively ignored.

discussed.[25] The results are, however, robust in this respect, as the earnings patterns where part-time workers are included turn out to be generally similar to those for full-time workers alone.

Finally, observations were deleted where the required information was missing, took extreme values (in the case of earnings), or was otherwise deemed unusable.[26]

The Labour Force Status and Earnings Variables

The employment and unemployment rates reported in the paper represent standard measures which essentially follow the usual Statistics Canada conventions, except for the treatment of current students, probably resulting in a small upward bias in measured unemployment rates.[27] For the broad activity rates (*i.e.*, including enrolment status), individuals are first classified in terms of any employment status (employed or unemployed), with non labour force participants then identified as enrolled or not based on the reason given for being out of the labour force.

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[25] The use of selection criteria based on current student status as of the interview date is precluded by the fact that the NGS databases do not possess a current enrolment status measure that is consistent across all data points. Indeed, this information is – surprisingly – missing from all surveys except 1987: the relevant question(s) were simply not asked. Furthermore, a strong argument can be made for retaining full-time workers who also happen to be students on the grounds that such individuals are first and foremost in the labour force and rightly belong in any analysis of earnings patterns – thus further justifying the use of the selection criteria based on labour force status used here rather than student status.

[26] In particular, the group of full-time workers with less than $5,000 ($1995) in earnings was deleted (the equivalent of a wage of about $3.20 per hour for 30 hours of work per week over 52 weeks). This affected no more than approximately one-half of 1 percent of the sample in each year, with a relatively high proportion of the first interview cases (where there were generally more such low earners) being individuals who then obtained a new diploma by the subsequent interview, suggesting the relevant jobs were research assistantships which are rather unlike more conventional forms of employment. "Other" workers (non-paid/self-employed) were also eliminated from the analysis, since the labour force status and earnings levels of such individuals are likely to depart from standard norms and such workers were. Furthermore, missing information for the full set of variables included in the companion regression analysis (Finnie [1999a]), resulting in the deletion of a similarly small number of individuals (under one-half of one percent).

[27] This departure from the standard conventions stems from the missing current enrolment status in most years' data noted above. More specifically, part-time students looking for work are normally counted as being unemployed, while full-time students looking for work are not (they are deemed to not be "ready for work" due to their full-time student status). Being unable to ascertain current enrolment status in a consistent fashion across all NGS surveys (see the note above), in this analysis, all those looking for work – *including* full-time students – were considered as being unemployed. The unemployment rates presented below are, therefore, slightly biased upward relative to what would be obtained with the more conventional definition (were it possible to implement it). This direction of bias was deemed particularly appropriate in the face of popular conjectures that employment opportunities have been deteriorating for graduates, as it becomes imperative to avoid any general downward bias in unemployment rates or understatement of any changes which may have occurred in this regard across cohorts, which might have been the case had unemployed students been excluded from the analysis. In short, the conventions adopted here should amplify – not understate – any "Generation X" effects with respect to unemployment rates that have occurred.

The earnings variable reflects what individuals would earn on an annual basis were the job to last the full year, regardless of the actual job status. In automatically adjusting for irregular work patterns over the course of the year, this measure represents the perhaps analytically more interesting *rate* of pay, rather than the amount necessarily earned.[28] All earnings values are expressed in constant 1995 dollars, rounded to the nearest thousand, and capped at the $99,000 upper limit which characterises the 1984 data (the lowest bound in the six databases), or $143,035 in constant 1995 dollars.[29]

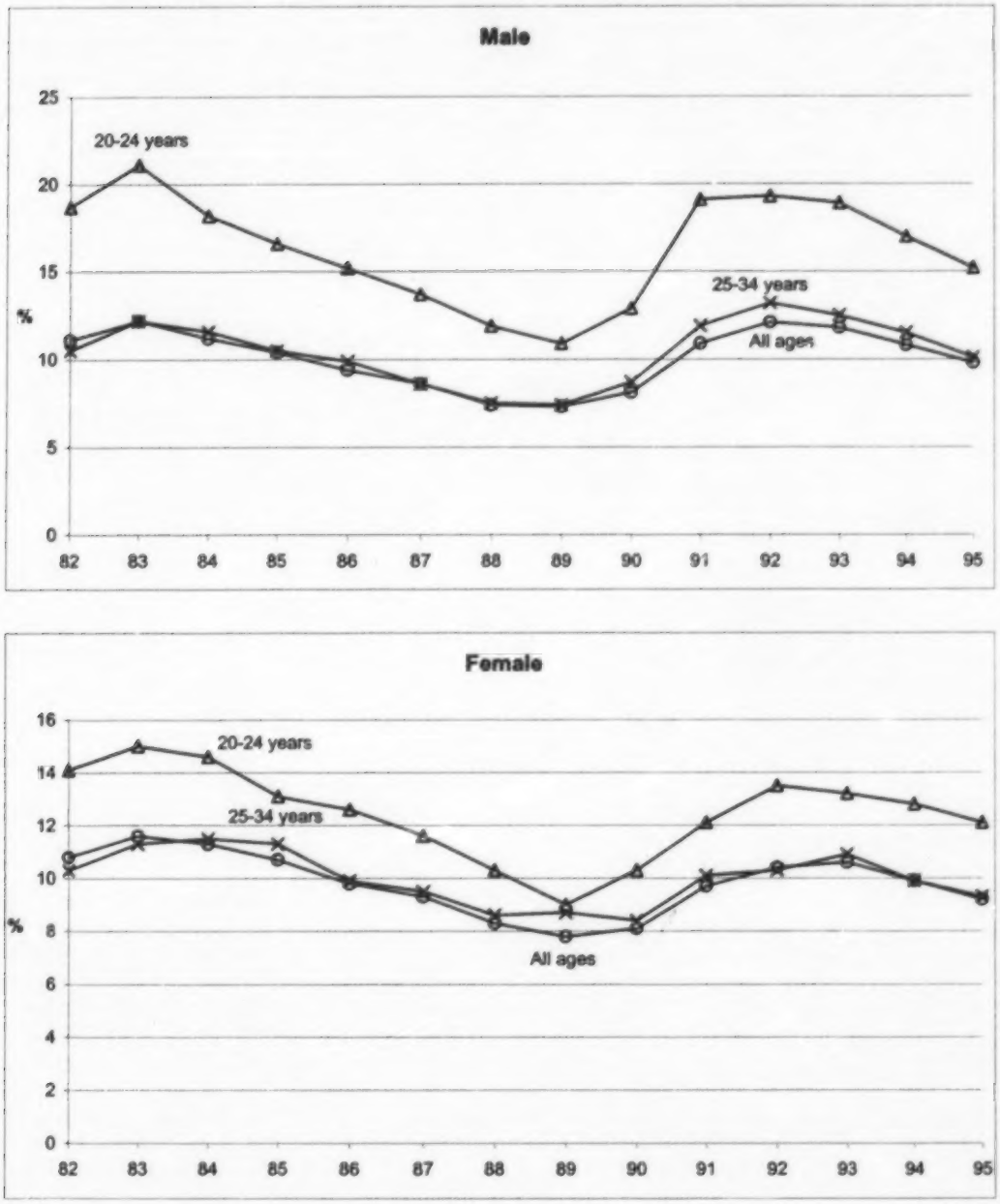
[28] Conversely, this measure obviously overstates actual earnings for those who worked less than the full year – which might in fact be the preferred variable in certain analyses, especially if work patterns are largely demand driven rather than the outcome of labour supply decisions. Finding that the earnings patterns were generally similar when part-time workers are included, as noted above (results not reported here), indicates that this does represent a major problem in this analysis.

[29] Failing to apply a common cap would distort comparisons of earnings levels across survey years because the years with the higher caps (generally the later ones – although there was some inflation-based erosion of the cap value in the most recent periods) tend to have higher earnings values simply due to the capping effects **per se** (as verified empirically). Applying a common cap thus provides a consistent measure of earnings across years – at least for values below the cap. Following up on this latter point, however, this consistency comes at the cost of a general downward bias in measured mean earnings levels. Furthermore, with the cap applied, any **changes** in earnings at the **highest** levels (*i.e.*, beyond the cap) are not observed and are, therefore, effectively set to zero, which could affect cross-year comparisons of average earnings levels, in particular. To attempt to minimize **this** problem, all relevant observations would have to be deleted, introducing a competing set of biases. Faced with these trade-offs and the associated choices of: i) simply using the variable caps which were applied to each year of data, ii) deleting the problem observations (*i.e.*, those beyond the caps), and iii) applying a common cap to all years of data, the decision was taken to apply the common cap. In practice, very few graduates had earnings above the cap (never more than one-half of 1 percent of the sample in any given year). On the other hand, tests show that this is a sufficient number of observations to significantly affect certain calculations/comparisons, particularly because such high earners tend to be concentrated in certain education level-sex groups, thus verifying the importance of the approach used here (*i.e.*, using common caps while including observations above the caps at the capped level).

Appendix B

General Labour Market Conditions, 1982-1995

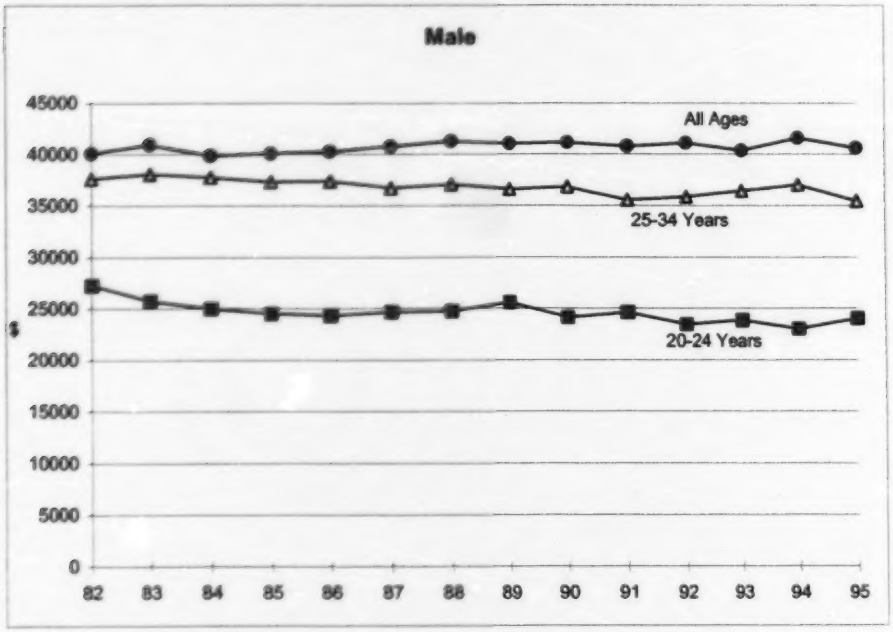
Appendix Figure 1: Unemployment Rates

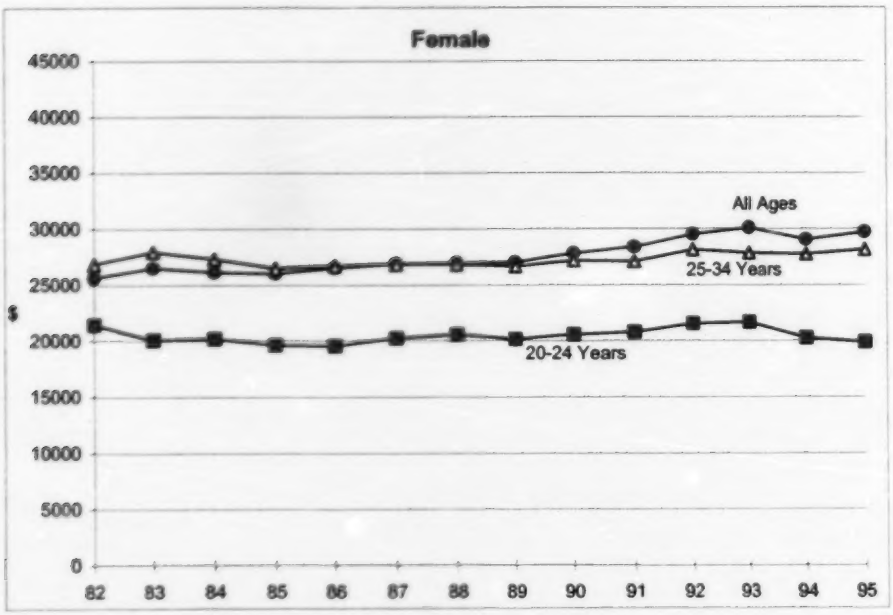


Source: Labour Force Historical Review, Statistics Canada, 71F0004XCB.

Appendix B (Cont.)

Appendix Figure 2: Mean Earnings of Full-Time Workers (1995 Constant Dollars)





Note: The 1983 data by age group are based on estimates calculated by the Income and Housing Surveys Section, Household Surveys Division, Statistics Canada.
Source: Earnings of Men and Women, Statistics Canada, catalogue 13-217, 13-217S and 13-577S Annual, 1981-1982 and 1984-1995.

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